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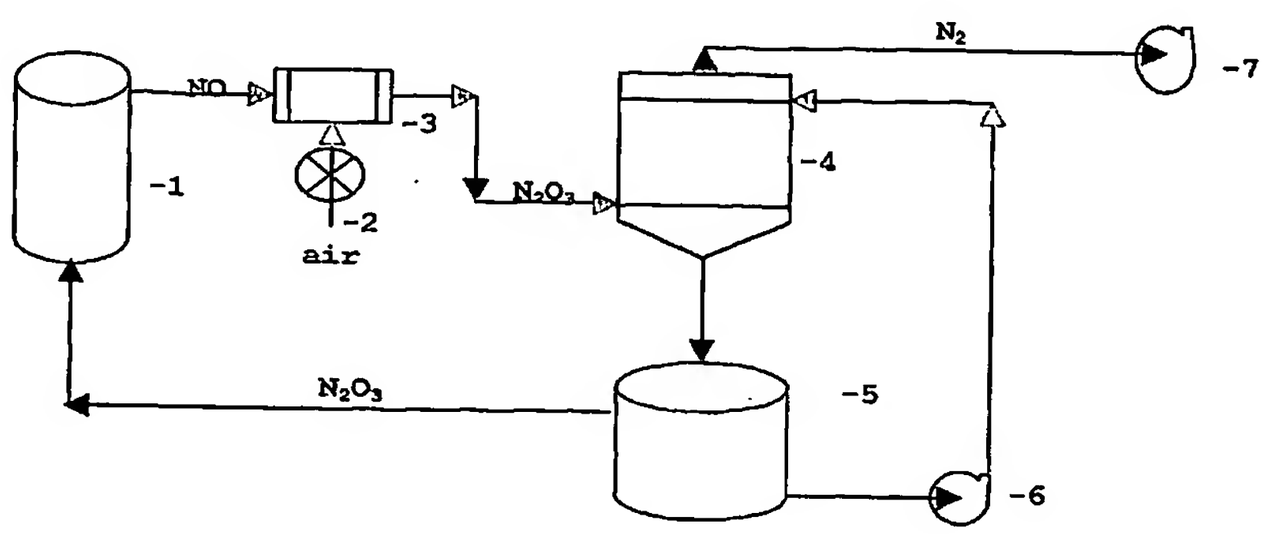
(54) Title: METHOD FOR PROCESSING SULFIDE MINERALS AND CONCENTRATES



(57) Abstract: The method is referred to hydrometallurgical process and serves for recovery of nonferrous, rare and precious metals from sulfide minerals and concentrates. The invention is aimed at creating conditions for the most complete extraction of metals, preventing formation of elementary sulfur. The objective is attained by means of the following: the hydrometallurgical method of sulfide minerals and concentrates processing, which involves sulfide minerals oxidation in aqueous medium using nitrogen oxides, envisages that the sulfide materials containing slurry are subjected to oxidation of the sulfide and the oxidation is realized under controlled conditions of the slurry acidity, i.e. with constant neutralization of sulfuric acid formed as a result of the sulfides oxidation, moreover, sulfuric acid is neutralized to acidity level, at which no formation of elementary sulfur occurs, while natural or artificial substances, such as $CaC0_3$, $MgC0_3$, $Ca(OH)_2$, CaO, NaOH, $CaHP0_4$ etc., are used as acidity neutralizers; the choice of a specific neutralizer is dictated by the necessity of formation of slurry neutralization products with assigned physicochemical properties: filterability, slurry thickening, arsenic substance insolubility, nontoxicity and other required properties. Oxidation of sulfide minerals is realized under agitation providing sufficient mass exchange and efficient occurrence of chemical reactions. Oxidation is realized in the temperature range of 20-90°C, mainly in the range of 65-85°C. The liquid-to-solid ratio may vary from 1:1 to 5:1, depending on effectiveness of the required precipitate formation and proceeding of sulfide oxidation reactions. Nitric and nitrous acids, as well as their oxides, mainly nitrous acid, $HN0_2$, and its oxide, N_20_3, are used as oxidizing agents. Regeneration processes of NO to N_20_3 are also described.

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